

File OKD987072006

Part 3

SOURCE EMISSION CALCULATIONS

JOB NUMBER: 04-196
 JOB NAME: NORIT AMERICAS, INC.
 LOCATION: PRYOR, OKLAHOMA
 UNIT TESTED: EAST SECONDARY CARBONIZER STACK SO2

SYMBOL	DESCRIPTION	UNITS	RUN NUMBER		
			1	2	3
CO2		%	6.6	7.9	7.4
O2		%	10.0	11.2	12.0
CO		%	0.0	0.0	0.0
N2		%	83.4	80.9	80.6
%EA	EXCESS AIR @ SAMPLING POINT	%	82.6	109.4	128.2
MWd	MOLECULAR WEIGHT OF DRY STACK GAS	LB/LB-MOLE (g/g-MOLE)	29.46 (29.46)	29.71 (29.71)	29.66 (29.66)
MW	MOLECULAR WEIGHT OF STACK GAS	LB/LB-MOLE (g/g-MOLE)	28.18 (28.18)	28.25 (28.25)	27.99 (27.99)
Cp	PITOT TUBE CALIBRATION		0.810	0.806	0.806
DELTA P	VELOCITY HEAD OF STACK GAS	"H2O (mm H2O)	0.037 (0.900)	0.036 (0.900)	0.067 (1.700)
DELTA P ^{^(1/2)}		"H2O	0.184	0.186	0.258
Ts	STACK TEMPERATURE	DEG. F (DEG. C)	1,684 (918)	1,684 (918)	1,862 (1,017)
Ps	STACK PRESSURE	"Hg Abs. (mm Hg) "H2O	29.38 (746.00) 0.00	29.34 (745.00) 0.00	29.38 (746.00) 0.00
Vs	STACK VELOCITY @ STACK CONDITIONS	FPM (m/SEC.)	1,229 (6)	1,235 (6)	1,790 (9)
As	STACK AREA	(SQ.INCHES) (SQ.METERS)	1,847 (1)	1,847 (1)	1,847 (1)
Qs	DRY STACK GAS VOLUME @ STANDARD CONDITIONS*	DSCFM (DSCM/HR)	3,401 (5,778)	3,360 (5,709)	4,409 (7,491)
	WET STACK GAS VOLUME @ STANDARD CONDITIONS*	WSCFH	229,565	230,400	308,717
Qa	ACTUAL STACK GAS VOLUME @ STACK CONDITIONS	ACFM (m ³ /HR)	15,762 (26,780)	15,846 (26,922)	22,964 (39,016)

* 68 Deg.F, 29.92 "Hg (20 Deg.C, 760 mm Hg)

SULFUR DIOXIDE EMISSION DATA

JOB NUMBER: 04-196
 JOB NAME: NORIT AMERICAS, INC.
 LOCATION: PRYOR, OKLAHOMA
 UNIT TESTED: EAST SECONDARY CARBONIZER STACK SO2

SYMBOL	RUN NUMBER		
	1	2	3
DATE	06/29/04	06/30/04	06/30/04
START TIME	1700	1708	2046
END TIME	1808	1816	2154
N - NORMALITY OF Ba(ClO4)2	0.0100	0.0100	0.0100
ML(I) - ml IN IMPINGER 2	369.00	348.00	282.00
ML(I) - ml IN IMPINGER 3	330.00	268.00	250.00
ML(A) - ml IN ALIQUOT #2	1.00	1.00	1.00
ML(A) - ml IN ALIQUOT #3	10.00	10.00	10.00
ML(B) - ml OF Ba(ClO4)2 TO TITRATE #2	4.90	6.98	9.00
ML(B) - ml OF Ba(ClO4)2 TO TITRATE #3	0.70	1.40	1.65
ML(BB) - ml OF Ba(ClO4)2 TO TITRATE BLANK	0.05	0.05	0.05
Tm - AVERAGE GAS METER TEMPERATURE, DEG.F	88	76	76
Vm - VOLUME OF DRY GAS SAMPLED @ METER CONDITIONS, FT^3	33.109	32.618	33.441
Pb - BAROMETRIC PRESSURE, "Hg Abs.	29.38	29.34	29.38
Qs - STACK GAS VOLUME DRY @ STANDARD CONDITIONS, *SCFM	3,401	3,360	4,409
C(I) - SO2 IN IMPINGER #2 IN mgs	572.69	771.72	807.65
C(I) - SO2 IN IMPINGER #3 IN mgs	6.86	11.58	12.80
C(T) - TOTAL SO2 IN IMPINGERS, IN mgs	579.55	783.30	820.45
ppm SO2	245.29	329.60	336.28
C(SO2) - EMISSION RATE OF SO2, lbs/day	199.55	264.91	354.65
C(SO2) - EMISSION RATE OF SO2, lbs/hr	8.31	11.04	14.78
Cs - EMISSION RATE OF SULFUR, lbs/day	99.78	132.45	177.32

* 68 Deg.F, 29.92 "Hg (20 Deg.C, 760 mm Hg)

$C(I) = ML(I) * [ML(B) - ML(BB)] * N * 32 / ML(A)$

$C(T) = C(I) \#2 + C(I) \#3$

$ppm \text{ SO}_2 = 0.7513 * C(T) * [Tm + 460] / Vm * Pb$

$C(SO_2) = ppm \text{ SO}_2 * Qs * 0.0002392$

SULFUR TRIOXIDE EMISSION DATA

JOB NUMBER: 04-196
 JOB NAME: NORIT AMERICAS, INC.
 LOCATION: PRYOR, OKLAHOMA
 UNIT TESTED: EAST SECONDARY CARBONIZER STACK SO2

RUN NUMBER	RUN NUMBER		
	1	2	3
DATE	06/29/04	06/30/04	06/30/04
START TIME	1700	1708	2046
END TIME	1808	1816	2154
N - NORMALITY OF Ba(ClO4)2	0.0100	0.0100	0.0100
ML(I) - ml IN IMPINGER	250.00	222.00	220.00
ML(A) - ml IN ALIQUOT	10.00	10.00	10.00
ML(B) - ml OF Ba(ClO4)2 TO TITRATE	0.47	0.48	0.67
ML(BB) - ml OF Ba(ClO4)2 TO TITRATE BLANK	0.05	0.05	0.05
Tm - AVERAGE GAS METER TEMPERATURE, DEG.F	88	76	76
Vm - VOLUME OF DRY GAS SAMPLED @ METER	33.109	32.618	33.441
CONDITIONS, FT^3			
Pb - BAROMETRIC PRESSURE, "Hg Abs.	29.38	29.34	29.38
Qs - STACK GAS VOLUME DRY @ STANDARD	3,401	3,360	4,409
CONDITIONS, *SCFM			
C(I) - SO3 IN IMPINGERS IN mgs	4.20	3.82	5.46
ppm SO3	1.42	1.29	1.79
C(SO3) - EMISSION RATE OF SO3, lbs/day	1.45	1.29	2.36
Cs - EMISSION RATE OF SULFUR, lbs/day	0.60	0.50	0.90

* 68 Deg.F, 29.92 "Hg (20 Deg.C, 760 mm Hg)

$C(I) = ML(I) * [ML(B) - ML(BB)] * N * 40 / ML(A)$
 $ppm SO3 = 0.6021 * C(I) * [Tm + 460] / Vm * Pb$
 $C(SO3) = ppm SO3 * Qs * 0.0002991$
 $Cs = C(SO3) / 2.5$

SUMMARY OF RESULTS

West Secondary Carbonizer Stack Sulfur Dioxide Condition I

Run Number	1	2	3
Date	06/29/04	06/30/04	06/30/04
Time	1700-1808	1708-1816	2046-2154
Stack Flow Rate - ACFM	17,729	16,535	19,980
Stack Flow Rate - DSCFM*	3,687	3,249	3,823
% Water Vapor - % Volume	12.25	12.60	12.83
% CO ₂ - % Volume	6.8	6.6	6.8
% O ₂ - % Volume	10.6	10.4	10.8
% Excess Air @ Sampling Point	93.9	89.7	97.9
Stack Temperature - Degrees F	1,736	1,851	1,908
Stack Pressure - " Hg	29.38	29.34	29.34
Sulfur Dioxide Emissions - dry ppm	275.16	290.02	303.21
Sulfur Dioxide Emissions - lbs/hr	10.11	9.39	11.55

* 29.92 " Hg, 68 Degrees F (760 mm Hg, 20 Degrees C)

SOURCE EMISSION SURVEY

JOB NUMBER: 04-196
 JOB NAME: NORIT AMERICAS, INC.
 LOCATION: PRYOR, OKLAHOMA
 UNIT TESTED: WEST SECONDARY CARBONIZER STACK SO2 CI

SOURCE EMISSION CALCULATIONS

SYMBOL	DESCRIPTION	UNITS	RUN NUMBER		
			1	2	3
DATE			06/29/04	06/30/04	06/30/04
BEGIN TIME			1700	1708	2046
END TIME			1808	1816	2154
P(b)	BAROMETRIC PRESSURE	"Hg Abs. (mm Hg)	29.38 (746.00)	29.34 (745.00)	29.34 (745.00)
P(m)	ORIFICE PRESSURE DROP	"H2O (mm H2O)	0.879 (22.300)	0.806 (20.500)	0.900 (22.900)
	DGM CALIBRATION FACTOR		1.018	1.018	1.018
V(m)	VOLUME DRY GAS SAMPLED @ METER CONDITIONS	ft.^3 (m^3)	32.806 (0.929)	30.963 (0.877)	32.627 (0.924)
	LEAK CHECK VOLUME	ft.^3	0.000	0.000	0.000
T(m)	AVERAGE GAS METER TEMPERATURE	DEG.F (DEG.C)	80 (27)	73 (23)	73 (23)
V(m[std])*	VOLUME DRY GAS SAMPLED @ STANDARD CONDITIONS*	DSCF (DSCM)	31.573 (0.894)	30.144 (0.854)	31.771 (0.900)
V(w)	TOTAL WATER COLLECTED, IMPINGERS & SILICA GEL	ml	93.4	92.1	99.1
V(w[gas])	VOLUME WATER VAPOR COLLECTED @ STANDARD CONDITIONS*	SCF (SCM)	4.408 (0.125)	4.347 (0.123)	4.678 (0.132)
%M	MOISTURE IN STACK GAS BY VOLUME	%	12.25	12.60	12.83
Md	MOL FRACTION OF DRY GAS		0.8775	0.8740	0.8717
Tt	NET TIME OF TEST	MINUTES	60	60	60

* 68 Deg.F, 29.92 "Hg (20 Deg.C, 760 mm Hg)

SOURCE EMISSION CALCULATIONS

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 LOCATION: PRYOR, OKLAHOMA
 UNIT TESTED: WEST SECONDARY CARBONIZER STACK SO2 CI

SYMBOL	DESCRIPTION	UNITS	RUN NUMBER		
			1	2	3
CO2		%	6.8	6.6	6.8
O2		%	10.6	10.4	10.8
CO		%	0.0	0.0	0.0
N2		%	82.6	83.0	82.4
%EA	EXCESS AIR @ SAMPLING POINT	%	93.9	89.7	97.9
MWd	MOLECULAR WEIGHT OF DRY STACK GAS	LB/LB-MOLE (g/g-MOLE)	29.51 (29.51)	29.47 (29.47)	29.52 (29.52)
MW	MOLECULAR WEIGHT OF STACK GAS	LB/LB-MOLE (g/g-MOLE)	28.10 (28.10)	28.03 (28.03)	28.04 (28.04)
Cp	PITOT TUBE CALIBRATION		0.811	0.811	0.811
DELTA P	VELOCITY HEAD OF STACK GAS	"H2O (mm H2O)	0.049 (1.200)	0.040 (1.000)	0.056 (1.400)
DELTA P ^{^(1/2)}		"H2O	0.216	0.196	0.234
Ts	STACK TEMPERATURE	DEG. F (DEG. C)	1,736 (947)	1,851 (1,011)	1,908 (1,042)
Ps	STACK PRESSURE	"Hg Abs. (mm Hg) "H2O	29.38 (746.00) 0.00	29.34 (745.00) 0.00	29.34 (745.00) 0.00
Vs	STACK VELOCITY @ STACK CONDITIONS	FPM (m/SEC.)	1,464 (7)	1,365 (7)	1,650 (8)
As	STACK AREA	(SQ.INCHES) (SQ.METERS)	1,744 (1)	1,744 (1)	1,744 (1)
Qs	DRY STACK GAS VOLUME @ STANDARD CONDITIONS*	DSCFM (DSCM/HR)	3,687 (6,264)	3,249 (5,520)	3,823 (6,495)
	WET STACK GAS VOLUME @ STANDARD CONDITIONS*	WSCFH	252,103	223,043	263,141
Qa	ACTUAL STACK GAS VOLUME @ STACK CONDITIONS	ACFM (m^3/HR)	17,729 (30,122)	16,535 (28,093)	19,980 (33,946)

* 68 Deg.F, 29.92 "Hg (20 Deg.C, 760 mm Hg)

SULFUR DIOXIDE EMISSION DATA

JOB NUMBER: 04-196
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 LOCATION: PRYOR, OKLAHOMA
 UNIT TESTED: WEST SECONDARY CARBONIZER STACK SO2 CI

SYMBOL	RUN NUMBER		
	1	2	3
DATE	06/29/04	06/30/04	06/30/04
START TIME	1700	1708	2046
END TIME	1808	1816	2154
N - NORMALITY OF Ba(CIO4)2	0.0100	0.0100	0.0100
ML(I) - ml IN IMPINGER 2	295.00	286.00	308.00
ML(I) - ml IN IMPINGER 3	276.00	271.00	273.00
ML(A) - ml IN ALIQUOT #2	1.00	1.00	1.00
ML(A) - ml IN ALIQUOT #3	10.00	10.00	10.00
ML(B) - ml OF Ba(CIO4)2 TO TITRATE #2	6.90	7.17	7.07
ML(B) - ml OF Ba(CIO4)2 TO TITRATE #3	0.85	0.78	3.82
ML(BB) - ml OF Ba(CIO4)2 TO TITRATE BLANK	0.05	0.05	0.05
Tm - AVERAGE GAS METER TEMPERATURE, DEG.F	80	73	73
Vm - VOLUME OF DRY GAS SAMPLED @ METER CONDITIONS, FT^3	32.806	30.963	32.627
Pb - BAROMETRIC PRESSURE, "Hg Abs.	29.38	29.34	29.34
Qs - STACK GAS VOLUME DRY @ STANDARD CONDITIONS, *SCFM	3,687	3,249	3,823
C(I) - SO2 IN IMPINGER #2 IN mgs	646.64	651.62	691.89
C(I) - SO2 IN IMPINGER #3 IN mgs	7.07	6.33	32.93
C(T) - TOTAL SO2 IN IMPINGERS, IN mgs	653.71	657.95	724.83
ppm SO2	275.16	290.02	303.21
C(SO2) - EMISSION RATE OF SO2, lbs/day	242.67	225.39	277.27
C(SO2) - EMISSION RATE OF SO2, lbs/hr	10.11	9.39	11.55
Cs - EMISSION RATE OF SULFUR, lbs/day	121.34	112.70	138.63

* 68 Deg.F, 29.92 "Hg (20 Deg.C, 760 mm Hg)

$C(I) = ML(I) * [ML(B) - ML(BB)] * N * 32 / ML(A)$

$C(T) = C(I) \#2 + C(I) \#3$

$ppm \text{ SO}_2 = 0.7513 * C(T) * [Tm + 460] / Vm * Pb$

$C(SO_2) = ppm \text{ SO}_2 * Qs * 0.0002392$

SULFUR TRIOXIDE EMISSION DATA

JOB NUMBER: 04-196
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 LOCATION: PRYOR, OKLAHOMA
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RUN NUMBER	RUN NUMBER		
	1	2	3
DATE	06/29/04	06/30/04	06/30/04
START TIME	1700	1708	2046
END TIME	1808	1816	2154
N - NORMALITY OF Ba(CIO4)2	0.0100	0.0100	0.0100
ML(I) - ml IN IMPINGER	253.00	243.00	271.00
ML(A) - ml IN ALIQUOT	10.00	10.00	10.00
ML(B) - ml OF Ba(CIO4)2 TO TITRATE	0.17	0.38	0.45
ML(BB) - ml OF Ba(CIO4)2 TO TITRATE BLANK	0.05	0.05	0.05
Tm - AVERAGE GAS METER TEMPERATURE, DEG.F	80	73	73
Vm - VOLUME OF DRY GAS SAMPLED @ METER CONDITIONS, FT^3	32.806	30.963	32.627
Pb - BAROMETRIC PRESSURE, "Hg Abs.	29.38	29.34	29.34
Qs - STACK GAS VOLUME DRY @ STANDARD CONDITIONS, *SCFM	3,687	3,249	3,823
C(I) - SO3 IN IMPINGERS IN mgs ppm SO3	1.21	3.21	4.34
C(SO3) - EMISSION RATE OF SO3, lbs/day	0.45	1.10	1.66
Cs - EMISSION RATE OF SULFUR, lbs/day	0.20	0.40	0.70

* 68 Deg.F, 29.92 "Hg (20 Deg.C, 760 mm Hg)

$C(I) = ML(I) * [ML(B) - ML(BB)] * N * 40 / ML(A)$
 $ppm SO3 = 0.6021 * C(I) * [Tm + 460] / Vm * Pb$
 $C(SO3) = ppm SO3 * Qs * 0.0002991$
 $Cs = C(SO3) / 2.5$

1. This project consists of the addition of a rotary kiln, after-burner, waste heat boiler, and auxiliaries to the existing activated carbon train at the Ceca Division's Pryor Plant. The rotary kiln unit is referred to as the primary carbonizer and its addition will expand plant capacity by 35% while improving product quality and allowing flexibility in raw material usage. With this new unit select grades of bituminous coal from Oklahoma can be used to manufacture activated carbon.

There will be two operating modes for this new unit which will be referred to as New Technology (processing Bituminous Coal into activated carbon), and Current Technology (processing Sub-Bituminous Coal into activated carbon). All calculations are based on a 50/50 split between the two operating modes which is the most economical basis for plant operation.

Feed to the current rotary kiln carbonizer will be diverted to a new feed screen and belt conveyor which will feed the new primary carbonizer. Solid product from the new carbonizer will be transferred by a new bucket elevator and then fed to the existing carbonizer.

The off gas stream from the new carbonizer, consisting of process gas, volatile hydrocarbons and water removed from the feed, and entrained feed fines are directed to a new after-burner.

11/30/88

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INSTRUCTION NO. 1

The afterburner, which operates at 1800°F (minimum) with 2 seconds residence time, consumes all combustible material. Heat is recovered from the afterburner exit gas by generating steam in a waste heat boiler. Boiler exit gas is sent to an exhaust stack through an ID fan. Provisions are being made for future addition of a gas scrubbing system if needed.

The two expected process operating modes differ in the primary carbonizer operating conditions. New Technology with bituminous coal feed uses heated air as the carbonizer process gas; the operation is exothermic; and the carbonizer is cooled by passing cooling air through an external jacket. Current Technology with Sub-bituminous coal feed uses inert gas as the process gas; the operation is endothermic; and the carbonizer is heated by combusting natural gas with air in the external jacket.

N009421

OKLAHOMA STATE DEPARTMENT OF HEALTH

AIR QUALITY SERVICE

MEMORANDUM February 6, 1989

TO: Doyle McWhirter, Director *DMc*
Permits & Enforcement Division
AIR QUALITY SERVICE

FROM: *JDS* Joyce D. Sheedy
Environmental Engineer
Permits Section

SUBJECT: Evaluation of Construction Permit Application 88-105-C
Ceca Division of ATOCHEM, INC.
Pryor, Oklahoma, Mayes County
Primary Carbonizer Addition to Activated Carbon Plant

The Ceca Division of ATOCHEM, INC. plans to add a primary carbonizer and auxiliary equipment to their activated carbon plant in Pryor. This addition will include the following new equipment: a primary diverter valve, primary carbonizer feed screen (45007), primary carbonizer screen fines screw conveyor (44106), primary carbonizer feed conveyor (44107), primary carbonizer inlet valve (43047), primary carbonizer (44100), primary carbonizer cooling air blower (44100-D), primary carbonizer combustion air blower (44100-C), primary carbonizer discharge screw (44105), primary carbonizer process air blower (44100-B), process air preheat exchanger (44100-E), primary carbonizer discharge elevator (43021), inert gas generator (44112), secondary carbonizer inlet valve (hot) (43119), secondary carbonizer cooling air blower (44002-J), secondary carbonizer process air blower (44002-K), afterburner air blower (44103-A), primary afterburner (44103), off-gas quench drum (44121), waste heat boiler (WHB) (44111), WHB air blower (44116), WHB vent stack (44104), ID fan (44110), dust collector (44114), dust collector discharge valve (44118), dust collector exhaust (44117), four knife gates (44109-A, 44109-B, 44109-C, and 44109-D), and a gas engine to be used as an emergency backup for the electric motor used to turn the primary carbonizer (a rotary kiln).

The primary carbonizer furnace jacket will be equipped with 12 one million BTUH natural gas fired burners. The primary carbonizer afterburner consumes coal fines and process hydrocarbons. The afterburner will be equipped with three 10.0 million BTUH natural gas fired burners. When processing sub-bituminous coal the burners will be in a "pilot light" status normally and used only when necessary to keep the temperature in the desired range. When processing bituminous coal, auxiliary natural gas firing will be required.

This modification is expected to expand the plant capacity by 35 percent while improving product quality and allowing the use of bituminous coal from Oklahoma. The addition will have two operating modes: New Technology (processing bituminous coal into activated carbon) and Current Technology (processing sub-bituminous coal into activated carbon). A 50/50 split between the two operating modes will be the normal basis for plant operation. Feed to the existing rotary kiln carbonizer will be diverted to a new feed screen (45007) and screw conveyor (44107) which will feed the new primary carbonizer (44100). Solid product from the new carbonizer will be transferred by a new bucket elevator (43021) and fed to the existing secondary carbonizer. The off-gas stream from the new

N009326

MEMORANDUM

Ceca Division of ATOCHEM INC.

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primary carbonizer, consisting of process gas, volatile hydrocarbons and water removed from the feed, and entrained feed fines will be directed to the new afterburner (44103). This afterburner, which will operate at 1800°F with a 2 seconds residence time, will consume all combustible material. Heat will be recovered from the afterburner exit gas by generating steam in a waste heat boiler (44111). The boiler exit gas will be sent to an exhaust stack (44104) through an ID fan. The New Technology with bituminous coal feed will use heated air as the carbonizer process gas. The operation is exothermic and the carbonizer will be cooled by passing cooling air through an external jacket. Current Technology with sub-bituminous coal feed will use inert gas as the process gas. The operation is endothermic and the carbonizer will be combusting natural gas with air in the external jacket.

The plant is expected to operate 24 hours/day, 7 days/week with a 10 percent down time for maintenance (8,000 hours/year). No more than 5,000 hours of operation will be in the New Technology mode. The maximum process weights will be 16,500 pounds/hour to the primary carbonizer feed screen (45007); the primary carbonizer feed conveyor (44107), the primary carbonizer (44100), the product screw conveyor (44105), the primary carbonizer discharge elevator (43021) and 2,000 pounds/hour to the primary screen fines screw conveyor (44106).

Expected air emissions are particulate matter (PM) emissions from the new coal handling equipment (baghouse 44114); the products of natural gas combustion from the primary carbonizer vent stack; and SO₂, PM, NO_x, and the products of natural gas combustion from the primary carbonizer, the afterburner and the waste heat boiler (stack 44104). The emission rates contained in Table 1 were estimated using test data from existing equipment (NO_x), materials balance (SO₂ and PM), AP-42, Table 1.4-1 (products of natural gas combustion) and the EPA publication NEDS Source Classification Codes and Emission Factor Listing, dated October, 1985 (coal dust from screening and conveying). Although the normal operating mode will be a 50/50 split (4,000 hours/year in the New Technology mode and 4,000 hours/year in the Current Technology mode), Ceca may operate the plant in the New Technology mode up to 5,000 hours/year and reduce the Current Technology mode operating hours to 3,000 hours/year. Table 1 reflects these two division of operating hours.

Table 1 Expected Air Emissions

	Vent Stack 44104					Primary Carbonizer			
	NT*	CT**	4,000/ 4,000	5,000/ 3,000	lb/hr	Vent Stack		Baghouse Stack	Stack
			Split TPY	Split TPY		TPY	lb/MMBTU		
PM	32.0	12.0	88.0	98.0	0.06	0.24	0.005	0.003	0.01
SO ₂	23.0	25.0	96.0	95.0	0.007	0.03	0.0006		
NO _x	16.0	21.0	74.0	71.5	1.20	4.80	0.10		
CO	0.6	0.6	2.4	2.4	0.24	0.96			
VOC	0.003	0.003	0.01	0.01	0.09	0.38			

* New Technology mode using bituminous coal

** Current Technology mode using sub-bituminous coal

N009327

Ceca Division of ATOCHEM INC.
88-105-C

The modification is expected to reduce NO_x emissions from the existing plant by 60 TPY. The decrease will occur because of the addition of the New Technology mode. In this mode some of the nitrogen containing volatile matter will be consumed at low temperature (less than 500°F) within the carbonizer rather than at high temperatures (1800°F within the afterburner as is the case in the Current Technology mode. The higher temperature favors NO_x formation.

The carbonizer addition will not emit any substance that is subject to Regulation 3.8 or NESHAP, nor will it increase the emission of any pollutant by 100 TPY. Emissions of any one pollutant at the existing plant do not exceed 250 TPY. Therefore, the addition is not a major source and is not subject to PSD. The NSPS for coal preparation plants, 40 CFR 60, Subpart Y exempts coal preparation plants which process less than 200 tons/day. The coal handling and processing equipment involved with the addition (new and existing) will process less than 200 TPD and, therefore, the addition is exempt from Subpart Y.

The addition should comply with applicable Oklahoma Clean Air Act Regulations 2.4, 3.1, 3.2, 3.3, 3.4, 3.6, and 3.7. The burners involved are less than 50 million BTUH so they are exempt from Regulation 3.5. The screens and conveying equipment for the feed stock (coal and coal pitch) handling will be enclosed and vent to a baghouse so fugitive dust will not be a problem.

Based on this evaluation, a Construction Permit can be issued.

N009328

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY □
Office of Air Quality Planning and Standards □
Research Triangle Park, North Carolina 27711 □

Mr. Morton Sterling, Director
Environmental Protection
Detroit Edison Company
200 Second Avenue, 482
Detroit, Michigan 48226

Dear Mr. Sterling:

This is a followup to the October 19, 1989 meeting during which Detroit Edison further discussed its position that the addition of natural gas firing capacity to the Greenwood Unit I Power Plant should not be subject to a prevention of significant deterioration (PSD) review. At the meeting, you requested that Environmental Protection Agency (EPA) Headquarters review Region V's previous determination that the proposed fuel conversion was a "major modification" for PSD purposes.

As you are aware, in a letter dated December 20, 1988, EPA Region V concluded that the proposed conversion of the oil-fired Greenwood Unit to dual capacity for oil and gas firing would subject the plant to a PSD review for nitrogen oxides (NOx). The Region's conclusion was based on a determination that 1) the source was not capable of firing natural gas prior to January 6, 1975 (and therefore was not covered by the PSD exemption for modifications under 40 CFR 52.21(b)(2)(iii)(e)(1)); and 2) there would be a significant net increase of NOx resulting from the change. As you have requested, we have reevaluated this finding in light of the additional information submitted by Detroit Edison during the October 19 meeting.

The information presented by Detroit Edison indicates that the emissions unit at the source was initially designed and permitted to fire both oil and gas. However, there is no evidence to demonstrate that the source as a whole had, or at any time initiated construction on, the equipment necessary to deliver natural gas to the combustion unit. Without such equipment, it would not be possible for the source to utilize natural gas as an alternate fuel. Consequently, it is our view that the source was not capable of accommodating natural gas prior to January 6, 1975. Therefore, the changes necessary to accommodate the firing of natural gas at the Greenwood Plant would, for PSD purposes, be considered a "physical change" to the source.

As requested, we have also evaluated the net emissions change at the source that would result from the modification. It is Detroit Edison's position that the large decreases in "allowable" emissions of sulfur dioxide, particulate matter, and NOx when burning natural gas rather than oil as a result of the modification, warrants special consideration. Specifically, Detroit Edison feels that the use of a cleaner fuel at the Greenwood Plant warrants a finding that there is no increase in actual emissions and accordingly no "major modification."

Under the PSD regulation, a "major modification" occurs when the physical or operational change at the source (in this case the installation of natural gas handling facilities and the firing of natural gas) would result in a significant net emissions increase for any regulated pollutant at the source. Whether the proposed use of natural gas at the Greenwood Plant would result in a "significant net emissions increase" depends on a comparison between the "actual emissions" before and after the physical or operational change. Where, as here, the source has not yet begun operations firing natural gas, "actual emissions" after the change to natural gas firing are deemed to be the source's "potential to emit" for that fuel [see 40 CFR 52.21(b)(21)(iv)]. Potential annual NOx emissions when firing natural gas at the Greenwood Plant greatly exceed its current actual emissions. Therefore, as a result of the ability to fire natural gas after the change, the emissions of NOx at the source would experience a "significant net emissions increase," within the meaning of the PSD regulations. The fact that current annual "allowable emissions" for the Greenwood Plant when firing oil may greatly exceed future allowable (or potential) emissions when firing natural gas is not relevant for PSD applicability purposes. See *Puerto Rican Cement Co., Inc. v. EPA* No.89-1070 (First Circuit) (slip op. October 31, 1989).

In summary, our review indicates that Region V correctly applied the PSD applicability criteria.

The PSD requirements include an air quality and additional impact analysis and the application of best available control technology (BACT). The BACT requirement applies to "each proposed emissions unit at which a net emissions increase would occur as a result of a physical change or change in the method of operation in the unit" [see 52.21(j)(3)]. Consequently, although the addition of gas firing would subject the source as a whole to a PSD review, the requirement to apply BACT is applicable only to those emissions units at the source which undergo both a physical or operational change and a significant net emissions increase. It appears that the only emissions unit at the Greenwood Plant affected by the proposal to fire gas would be the existing boiler. Historically, it has been EPA's policy that where the individual boiler being converted is capable of accommodating the alternate fuel, BACT would not apply.

In this case, in addition to the physical changes at the source necessary to deliver natural gas to the existing boiler, a number of canes capable of burning natural gas would be installed in the existing burner assemblies. Modifications to the unit's overfired air duct are also planned. We also understand that there will be no changes in the present oil burning system, which will be retained.

Our review indicates that, by itself, the addition of gas canes to the burners is not a physical change or change in the method of operation in the unit and, consequently, would not subject the boiler to a BACT review. Therefore, if the sole change to the boiler is the addition of the canes, then, in this case, the only requirements necessary for a PSD permit are an air quality analysis, additional impacts analyses, and (if applicable) a Class I impact analysis -- the application of BACT is not required. However,

the information submitted by Detroit Edison indicates that changes to the boiler's overfired air duct are also planned. At this time, without additional information on the nature and scope of the work to be done on the overfired air duct, we cannot determine whether these are physical or operational changes to the boiler that are necessary to make the boiler capable of accommodating natural gas. If the ducting work is necessary for this purpose, then a BACT analysis would likely be required.

In addition, it is unclear from the information submitted whether Detroit Edison plans to undertake further modifications to the boiler which would allow 100 percent load when firing natural gas. Currently, the unit as presently configured has the potential of achieving only 75 percent load when firing natural gas. To achieve a higher load, substantial modifications to the unit apparently would be required. These types of physical changes to the boiler likely would require a full PSD review, including a BACT analysis for the boiler. The BACT analysis would require that the source evaluate the use of all available additional air pollution controls for reducing NOx emissions. The analysis would consider retrofit costs for add-on controls and the fact that gas is a relatively clean-burning fuel. Consequently, in this case, it is possible that the currently planned use of a low-NOx burner design may be BACT for gas firing. However, such a conclusion would have to be demonstrated through the requisite BACT analysis. I have asked Region V to work with you should you need assistance in preparing the analysis.

Sincerely,

Gerald A. Emison
Director
Office of Air Quality Planning
and Standards

cc: J. Calcagni, EPA/AQMD
D. Kee, EPA/Region V
G. Foote, EPA/OGC

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUL 28 1983

OFFICE OF
AIR, NOISE AND RADIATION

SUBJECT: PSD Applicability Pulp and Paper Mill

FROM: Director
Stationary Source Compliance Division
Office of Air Quality Planning and Standards

TO: Michael M. Johnston, Chief
Air Operations Section - Region X

Your request dated July 6, 1983, to Mike Trutna concerning a PSD applicability issue has been forwarded to my office for response. Your request concerns a pulp and paper company that is proposing to install a bleaching plant and a larger digester. While the construction of these units does not by itself cause increased emissions, emissions from the recovery boiler as a result of this construction activity will increase above the significance levels, but remain below the maximum design permit levels. Your question, is whether this a major modification under the PSD requirements.

The PSD rules at 40 CFR 52.21 (b) (2) define major modifications as "any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the Act." Net emissions increase is defined as:

"the amount by which the sum of the following exceeds zero: Any increase in actual emissions from a particular physical change or change in method of operation at a stationary source; and Any other increases and decreases in actual emissions at the source that are contemporaneous with the particular change and are otherwise creditable."

Major modifications are, therefore, determined by examining changes in actual emission levels. Actual emissions are defined as:

"the actual rate of emissions of a pollutant from an emissions unit, as determined in accordance with sub- paragraph (ii)-(iv) below

- (ii) In general, actual emissions as of a particular date shall equal the average rate, in tons per year, at which the unit actually emitted the pollutant during a two- year period which precedes the particular date and which is representative of normal source operation. The Administrator shall allow the use of a different time period upon a determination that it is more representative of normal source operation. Actual emissions shall be calculated using the units actual operating hours, production rates and types of materials processed, stored, or combusted during the selected time period.
- (iii) The Administrator may presume that source specific allowable emissions for the unit are equivalent to the actual emissions of the unit.
- (iv) For any emissions unit which has not begun normal operations on the particular date, actual emissions shall equal the potential to emit of the unit on that date."

Since this source has been in operation for some time, subparagraph (iv) does not apply. Your memo indicates that the recovery boiler is subject to a permit limit. Ray Nye of your staff has informed my staff that this permit limit binds the recovery boiler to a level of 0.1 gr/dscf, but does not provide any discussion on the unit's operating rate. The recovery boiler has operated in the past at a rate of 450 tons/day, consistent with existing digester capacity. Although the regulations provide a presumption for the use of allowable emissions when source specific limits are established, the preamble at 45 FR 52718 (August 7, 1980 states that:

"The presumption that Federally enforceable source specific requirements correctly reflect actual operating conditions should be rejected by EPA or a State, if reliable evidence is available which shows that actual emissions differ from the level established in the SIP or permit."

Therefore, since the recovery boiler could not have operated at a level higher than that provided by the existing digester capacity, any increase in actual emissions at the recovery boiler which will result from the increased capacity provided by the larger digester must be considered for the purposes of PSD applicability.

Once it is determined whether there is a significant net emissions increase (summing the emission increases from the larger digester, new bleaching plant and the increased operation of the recovery boiler) in conjunction with any contemporaneous emission increases and decreases, the PSD requirements should be applied, including BACT and air quality analyses. The regulations at 40 CFR 52.21(j)(3) require that:

"A major modification shall apply best available control technology for each pollutant subject to regulation under the Act for which it would result in a significant net emissions increase at the source. This requirement applies to each proposed emissions unit at which a net emissions increase in the pollutant would occur as a result of a physical change or change in the method of operation in the unit."

Since the recovery boiler itself will not be undergoing a physical change or change in the method of operation, it will not have to apply BACT. However, all emissions increases must undergo air quality analysis and will consume applicable air quality increments.

This response has been prepared with the concurrence of OGC and CPDD. Should you have any questions concerning it, please contact Rich Biondi at 382-2831.

Edward E. Reich

cc: Mike Trutna
Peter Wyckoff
Dave Rochlin

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 10, Seattle, Washington 98101

DATE: JUL 6 1983

SUBJECT: PSD Applicability

FROM: Michael M. Johnston, Chief
Air Operations Section

TO: Mike Trutna, Chief
New Source Review Office

A pulp and paper company is in the process of transferring the mill to a new owner. The new owner is proposing to install a bleaching plant and a larger digester to accommodate market demand for bleached pulp. While the construction of these units do not by itself cause increased emissions, emission from the recovery boiler as a result of this construction activity will increase above the significant levels, but remain below the maximum design permit limits. The company contends that PSD is triggered only if the net emissions increase from the specific modifications alone exceeds the threshold levels thereby releasing the project from review.

Region 10 has interpreted the term "net emissions increase" as any significant increase in actual emissions from a physical change or change in the method of operation at a stationary source. In this case, do we look at emissions from the specific modifications themselves or do we look at the overall change in actual emissions from the entire facility? The recovery boiler throughput was limited due to the size of the digester. Although the recovery boiler can accommodate the larger digester, we feel that the physical change and change in method of operation constitutes a modification.

If you have any questions please feel free to contact me or Ray Nye of my staff at (FTS) 399-7154.



EPA COPY

98-171-C(M-2) PSD

March 12, 2008

Mr. Eric Milligan
Oklahoma Department of Environmental Quality
707 N Robinson
Oklahoma City, OK 73102

RECEIVED

MAR 13 2008

AIR QUALITY

Re: Norit Americas, Inc.
Pryor Activated Carbon Plant
Permit Number: 98-171-C (M-2)
Prevention of Significant Deterioration Air Dispersion Modeling Report and NO_x and
SO₂ BACT Analyses Reports

Dear Mr. Milligan:

Please find enclosed the Prevention of Significant Deterioration (PSD) Air Dispersion Modeling Report for the Norit Americas, Inc. Pryor Activated Carbon Plant, located in Pryor, Oklahoma (Norit Pryor Facility). This submittal is being made as part of the technical data supporting the Tier II Air Quality Permit Application for Permit Number 98-171-C (M-2) as submitted in December, 2007.

This retroactive PSD analysis was performed per the requirements of the Consent Order (CO) between the Oklahoma Department of Environmental Quality (ODEQ) and Norit in 2007. This retroactive PSD review was triggered by the installation of a new Primary Carbonizer at the Norit Pryor facility in 1988 and 1989, which resulted in an increase in emissions of Particulate Matter of less than 10 microns in diameter (PM₁₀) and Sulfur Dioxide (SO₂) that were later determined to exceed the PSD significance thresholds for those pollutants. As part of the Consent Order signed in 2007, Norit was required to complete an Air Quality Permit Application to authorize emission increases from this and other related projects, and to conduct a PSD analysis for SO₂ and PM₁₀. During the project discussion, it was further determined that PSD analysis was required for Nitrogen Dioxide (NO₂) due to increases in emissions proposed as part of the the carbonizer project.

The Air Dispersion Modeling Report presents the results of PSD modeling for site-wide emissions of all pollutants subject to a Retroactive PSD review and for NO₂. The U.S. EPA's PSD modeling guidance¹ requires modeling SO₂ 3-hour, 24-hour, and annual; NO₂ annual; and PM₁₀ 24-hour and annual averaging periods. Modeling was performed in accordance with the "Premodeling Protocol for Prevention of Significant Deterioration Air Dispersion Modeling" as submitted to ODEQ in October, 2007.

¹ U.S. EPA, Draft New Source Review Workshop Manual. Prevention of Significant Deterioration and Nonattainment Area Permitting, U.S. EPA, Office of Air Quality, October 1990.

In summary, air dispersion modeling results predict that there are no exceedances of the National Ambient Air Quality Standards (NAAQS) or PSD Increment standards for any pollutant, for any averaging period that would be caused or contributed to by the Norit Pryor Facility operations. Please note that a few predicted exceedances of various standards for SO₂ and PM₁₀ for different averaging periods are clearly documented in the modeling report to be caused by distant off-site sources at the locations and times when the maximum concentrations created by all Pryor Facility sources are well below the appropriate significance (PSD *De minimis*) levels.

Please note that, as a result of the PSD Air Dispersion Modeling analyses, Norit Pryor Facility wishes to propose the following two changes to the representations made in the December 2007 Tier II Air Quality Permit Application to further minimize the ambient air quality impacts from the on-site source operations:

1. Maximum hourly emissions of Particulate Matter (PM) from the Primary Carbonizer are proposed to be limited to 30 pounds per hour. Annual average emission rates of PM from the Primary Carbonizer are proposed to be limited at 131.4 tons per year.
2. The stack height of the Secondary Carbonizer stack will be raised to 140 feet.

It should also be noted that the results of the PSD Air Dispersion Modeling as presented in the attached report should be considered conservative. Where reasonable, the modeling data and assumptions were adjusted to ensure conservativeness of the model predictions. For example, all PM emissions represented in the December 2007 Tier II Air Quality Permit Application were assumed to be less than 10 microns in size, and therefore were included in the modeled emission rates of PM₁₀. This is a very conservative assumption as anecdotal information from Norit estimates that at least 10%, and in some cases up to 20%-25% of PM emissions from the Pryor Facility are greater than 10 microns in diameter.


The most conservative assumptions were made during the PSD NAAQS and increment modeling steps. With the exception for a few selected facilities, Potential-to-Emit (PTE) emission rates were used in lieu of actual emission rates from off-site sources. As PTE rates are almost always higher than actual emission rates, the model-predicted impacts are likely overestimated. In addition, actual PSD Baseline emissions for PSD Increment modeling were assumed zero for all facilities for which air permits were modified after 1975. Sage Environmental believes that at least some of such facilities may have operated prior to the PSD Baseline date before their permit was modified.

Please note that per your guidance as received during your phone conversation with Mr. Igor Shnyder of Sage Environmental, we are not forwarding a copy of this modeling report to U.S. EPA Region VI office.

Additionally, please find enclosed the other remaining portions of the PSD technical review completed as part of this project. These portions include the Best Available Control Technology Review analyses for NO_x and SO₂ emissions.

If you have any questions regarding this submission, please contact Mr. Dale Fentress of Norit at (918) 825-8316. Thank you for your time and consideration regarding this matter and your constant support and quick responses to our requests during the modeling.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read 'Ryan Atkinson', with a long horizontal flourish extending to the right.

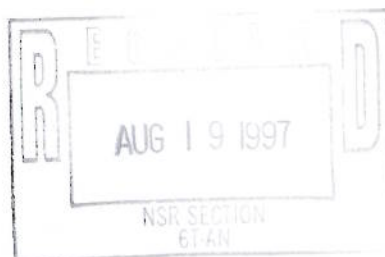
Mr. Ryan Atkinson
Project Manager
Sage Environmental Consulting, LP

cc:

Mr. Herb Neumann - ODEQ
Mr. Dale Fentress - Norit Americas, Inc.
Mr. Curtis Miles - Norit Americas, Inc.
Mr. Igor Shnayder - Sage Environmental Consulting, LP

August 13, 1997

Dr Allyn M Davis (6H)
U S Epa Region VI
1445 Ross Avenue
Dallas, TX 75202



NORIT AMERICAS INC.
Route 3, Box 69-6
Pryor, OK 74361-9803
Tel. 918-825-5570
Fax 918-825-5665

**RE: Class 1 Modifications to Permit No. 987072006 - NORIT Americas Inc., Pryor, Oklahoma,
EPA ID No. OKD987072006**

Dear Sir or Madam:

NORIT Americas Inc. operates a Spent Activated Carbon (SAC) Regeneration Facility under Permit No. 987072006. The facility is located at 6th and Hunt Streets in Pryor, Oklahoma. In accordance with 40 Code of Federal Regulations § 270.42(a)(1)(ii), as incorporated by reference at Oklahoma Administrative Code 252:200-3-2, NORIT Americas Inc., is providing notification of implementation of Class 1 modifications to the subject permit.

MODIFICATIONS

Replacement of Kiln End Seals - The Oklahoma Department of Environmental Quality (ODEQ) was notified of a Class 1 Modification to the subject permit on May 23, 1997. The modification involved replacement of the regeneration unit kiln end seals which were worn. The single seal was replaced with a double seal providing for increased containment of kiln gases in the event of a positive pressure excursion in the kiln.

Permit Language Corrections - The ODEQ was notified of a Class 1 Modification to the subject permit on May 23, 1997. The modification incorporated the following corrections to permit language:

- Updating regulatory citations
- Corrections to reflect ownership of the facility
- Corrections to incorporate correct permitted feed rate

Emergency Coordinator/Alternate List - The ODEQ was notified of a Class 1 Modification to the subject permit on June 22, 1997. Modifications were made to the Emergency Coordinator/Alternate list to reflect changes in facility personnel.

Copies of these modification notifications may be viewed at the Oklahoma Department of Environmental Quality, Waste Management Division, located at 1000 N.E. 10th Street, Oklahoma City, Oklahoma.

Sincerely,

R. David Gibby
Environmental Manager